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T H E

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A VIVIPAROUS FLY.

BY REV. SAMUEL LOCKWOOD, PH. D.



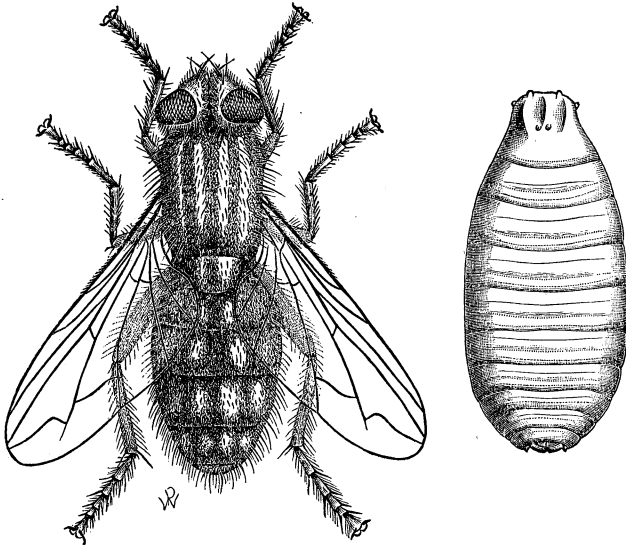
THE question, which is the mother of the chicken, the hen that laid the egg, or the hen that hatched it, would have no place in casuistry if all hens produced their chickens ready made. And there is a great deal of difference between the fly that lays simple eggs, and the one that brings forth living grubs. Thus it was, that what we beheld on the 15th day of June had for us all the novelty of a new sensation. The day was very warm, and I was about leaving my study, when my attention was drawn to a peculiar looking fly on the window. As it was quite large, it occurred to me that it would make a nice morsel for the tree toad in the fernery; so the intruder was captured, and I was about presenting the prize to my pet with goggle eyes, but an open countenance, when a sudden change came over my mind; for in the palm of my hand appeared what I took for eggs of an elongate form. My pocket lens at once showed me that these were not eggs, but real, live maggots, each about .06 of an inch in length; and there, right under my own eyes, even in my hand, the parent fly was busily depositing these little squirming things. The fly continued emitting the grubs, almost without cessation, in numbers varying from one to three at a time. They were very active, twisting themselves into animated knots, each containing from three to six individuals. The entire number of grubs emitted was sixty-one; although it may possibly have been more, as I could not find out whether

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any had been lost during the act of capture. I put the parent fly and about half her progeny into spirits. They were quite active in the strong 95 per cent. alcohol, and lived a good while, although the fly soon died.

Dr. Packard has kindly determined the species for us, and its systematic name is *Sarcophaga carnaria* Linn. (Fig. 34). Though ignorant of the habits of this curious fly, I resolved to make an effort to raise the remaining larvæ. They were now three hours old, and the little things were becoming less active because of the de-

Fig. 34.



The Viviparous Fly and its Pupa Case.

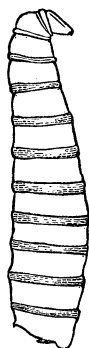
siccating effect of the hot atmosphere. There was no time to lose, so I took a flower-pot, and filled it with porous or sandy earth, and set the pot in a saucer with sufficient water to make it a little moist. Next a bit of fresh kidney fat was put on the earth. On this flesh I laid the tiny grubs, and was soon gratified with seeing the most vigorous of them instinctively recede into the folds of the fat, and thus disappear. A glass tumbler was next put over all, and the arrangement was complete.

Four days' absence from home, and no observations. The larvæ were now a little over five days old and, with the exception of one,

had all entered the ground. This one, which lay between the flesh and the earth, was the straggler of the company. Perhaps it was weak, as it was making ineffectual efforts to follow its companions in their search for proper places for their pupa sleep. But why should it be weak? It certainly was as large—it seemed, I thought, even larger than any of those that had successfully retired. Pray, you, who think that instinct cannot err, are there not larvæ which are gluttons? Or, turning to the man of facts, do larvæ ever overfeed? Whatever the facts may be, the case suggested parallel instances, wherein bipedal gourmands had found it difficult to get away from the relics of the feast, although all else were comfortably off to their dormitories.

I now carefully examined the earth in the flower-pot, and found the larvæ of large size and in holes reaching nearly to the bottom of the pot. They are now six days old, and have left the flesh just half a day. Measuring one of these white maggots of the average size, its length in fractions of an inch was .50 and the breadth was .25. It should be remembered that, generally, larvæ when disturbed contract their dimensions. The same larva when in motion was in length .85. One of these fully grown larvæ (Fig. 35) was put into alcohol of ninety-five proof. It continued quite active for 84 minutes, and sustained life in this element 134 minutes, all of which time it was completely immersed in the fluid.

Fig. 35.

Larva of
Flesh Fly.

June 22d.—The larvæ have taken on their brown pupa cases, and pretty things they are, of a cylindrical form, with an erect little fringe at the posterior end, something like the crown on a whortleberry (Fig. 35). There are still three of these white grubs that have not yet taken on their pupa change. These, though rather lively when disturbed, like other indolent people, must be regarded as laggards, for all that, and so were taken out and devoted to experiment. One was immersed in clear turpentine, another in Fowler's solution of arsenic, and the third in essence of peppermint of full strength. Repeating the previous experiment the results stand thus :

A fully grown larva six days old in 95 per cent. alcohol was quite active for 84 minutes, and lived 134 minutes; of the fully grown larvæ seven days old, the one in turpentine spun rapidly in the fluid, and motion ceased in 27 minutes; the one in essence of

peppermint kept up motion for 70 minutes; the one in Fowler's solution only ceased motion at the end of 53 minutes.

In the light of such facts, what reprobation is too severe upon the useless and cruel practice of drenching horses with violent medicaments for the bots? The ailment thus known is due to the presence in the animal's stomach of the larvæ of the bot-fly (*Gastrophilus equi* Fabr.). By its formidable mouth-hooks this larva clings to the walls of the stomach. Now it must be evident that by such methods of treatment, either to kill this parasite, or detach it from its hold would require medicines in such quantity, and of such power, that death to the poor animal would become inevitable before even its tormentors had been materially affected. Scarcity of specimens limited the experiments. I had meant to try the effect of suffocation, by immersing them in some one of the animal oils, for it is possible that herein may be found a simple remedy for that malady in horses.*

July 6th.—The glass on the flower-pot has been carelessly displaced several days. I noticed certain depressions in the earth, such as are made when little holes are filled up by the crumbling of their sides. The sight was ominous. Imagine the feelings which prompted me to exclaim suspiciously, "The imagines are gone." Alas, it was so! From the dryness of the depressions, and other indications, I was satisfied that the perfect flies had taken flight on the Fourth of July—thus, in a way against which no despot could demur, they had entered on their freedom on Independence Day! All this was very fine; but believing that patriotism should not extend to flies, the whole transaction did violence to my scientific instincts. In chagrin I slowly removed the earth

* Long ago my attention was called to the tenacity of larval life when exposed to poisons. I was forced by the claims of justice to take part in a toxicological examination of the internal organs of a person who had been nine months buried. These were put in a large glass jar, and the jar filled with water. It was summer. A small portion of the viscera rose above the fluid. In three or four days, I noticed the presence of a great number of large white larvæ, doubtless of the common blow-fly. We obtained enough bichloride of mercury, to establish the fact that the woman had died by taking a very large quantity of this terrible poison. Naturalists know how well this drug will preserve animal tissues. And in this case, the blood in the capillary vessels was of a bright color, as if fresh. And despite the presence of so much poison, the larvæ grew. Whether they would change to flies, I cannot say. Another case is that of the horse of a friend, which was injured by accident and had to be killed. The animal was opened, and the walls of the stomach were found to be covered with the larvæ of the bot-fly. A piece of the stomach was spread on a board in the sun. Some turpentine was poured on the larvæ, with but little effect, as not one was detached, when it was examined an hour afterwards. Some whale oil was then poured on them. They let go immediately, and soon all died.

from the pot. There were the little coffins—eight of them, and all empty. One was so much smaller than the others, that I concluded it must have contained a male. Very pretty things were these little cylindrical cases — the pupa coverings. (Fig. 34). At the thicker end a tiny lid was uplifted, much as if the sawn-off end of a cocoanut should serve as a lid to the shell, and should be raised to let out a captive bird.

So each having made for itself a little coffin had lain therein just thirteen days. “*Thirteen* days,” whispered a friend, a little superstitious about that number. “*Thirteen* days! The fault of their escape is not yours at all. It is a clear case of bad luck.” Well, my good friend, your theory is charitable at the least. But in my humble and penitent judgment, it does not condone the blunder which at the auspicious moment allowed the prize to fly away. Nature, like the Oracle, exacts of her inquirers watchful attention.

THE PRAIRIE BIRDS OF SOUTHERN ILLINOIS.

BY ROBERT RIDGWAY.

HAVING familiarized the readers of the NATURALIST to some extent with the general character and appearance of the prairies of Southern Illinois in our article on “The Woods and Prairies of the Upland Portions,” I shall now give an account of an ornithological reconnoissance of Fox Prairie, in Richland county, made in the summer of 1871. As this reconnoissance resulted in the discovery of several species of birds new to the state,* a few details concerning it may not be uninteresting to our readers. The field of our observations was a prairie of considerable extent, lying about four miles to the westward of the town of Olney, on the Ohio and Mississippi Railroad, and is merely one of the numerous arms or bays of the Grand Prairie which extend eastward into the forest region of the Wabash valley.

My companions and I arrived at it a little before noon, and saw before us the usual modern prairie prospect. A rolling plain spread away from us, the farther side bounded by the border of timber, while the prairie itself was treeless, except where some

* See AMERICAN NATURALIST, Vol. VI, July, p. 430.